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Blood RNA Preservative Tubes — Product Insert

Product # 52610, 52710

Intended Use

Norgen's **Blood RNA Preservative Tubes** are intended for the collection of whole blood and stabilization of cellular RNA for up to 12 days at 18 – 25°C prior to RNA purification.

Summary

Norgen has developed a system that enables the collection, stabilization, storage, and transportation of whole blood specimens, together with a rapid and efficient protocol for purification of intracellular RNA. The system requires the use of Norgen's **Blood RNA Preservative Tubes** for blood collection and RNA stabilization, followed by RNA purification using **Norgen's Preserved Blood RNA Purification Kit (for use with Norgen Blood RNA Preservative Tubes).** Collection of whole blood is the first step in many molecular assays used to study cellular RNA and gene expression. However, a major problem in such assays is the instability of the cellular RNA profile *in vitro*. Studies have shown that the copy numbers of individual mRNA species in whole blood can change more than 1000-fold during storage or transport at room temperature, due to rapid RNA degradation and by induced expression of certain genes after the blood is drawn. Such changes in the RNA expression profile interfere with reliable studies of gene expression. A method that preserves the RNA expression profile is therefore essential for accurate analysis of gene expression in human whole blood.

Sample Collection and Stabilization

Norgen's **Blood RNA Preservative Tubes** contain an aqueous preservative that protects RNA molecules from degradation and minimizes induction of gene expression. Norgen's **Blood RNA Preservative Tubes** are intended for the collection of whole blood and stabilization of cellular RNA for up to 12 days at 18 – 25°C. The actual duration of RNA stabilization may vary depending upon the species of cellular RNA and the downstream application used. Five different transcripts were validated for stabilization specifications (IL-16, NFKβIA, RAS1, FOS and IL1B gene transcripts).

Performance Characteristics of Norgen's Blood RNA Preservative Tubes

After blood has been collected into Norgen's Blood RNA Preservative Tubes, the intracellular RNA profile remains stable for 12 days at room temperature (18°C to 25°C), 21 days at 4°C, and for extended periods of time at -20°C and below.

Kit Components:

Component	Product # 52610 (48 tubes)	Product # 52710 (96 tubes)
Blood RNA Preservative Tubes	3 x 16 tubes	6 x 16 tubes
Product Insert	1	1

Customer-Supplied Reagents and Equipment

- Blood Collection Set
- Alcohol swap for cleansing site
- Dry sterile gauze
- Tourniquet
- Needle disposal container for used needle

Storage Conditions and Product Stability
Norgen's Blood RNA Preservative Tubes should be kept tightly sealed and stored upon arrival at 4°C - 8°C. The Blood RNA Preservative Tubes can be used until the end of the expiration month indicated on the tube label.

Note: ***Avoid the exposure of the Blood RNA Preservative Tubes to direct sunlight. Exceeding the maximum storage temperature may affect the quality of the tube (vacuum loss, drying out of preservative, precipitation, coloring).***

General Precautions

- Follow universal precautions. Use gloves, eye protection, and other personal protective equipment to protect from blood splatter, blood leakage and possible exposure to bloodborne pathogens.
- Handle all biological samples and blood collection sharps safely and according to the policies and procedures of your facility. Obtain appropriate medical attention in the event of any exposure to biological samples, since they may transmit HIV (AIDS), viral hepatitis, or other infectious disease.
- Discard all blood collection sharps and blood collection tubes in biohazard containers approved for their disposal.
- Do not re-use the Norgen Blood RNA Preservative Tubes.
- Do not use the Norgen Blood RNA Preservative Tubes after the expiration date printed on the tube label.
- Norgen's Blood RNA Preservative Tubes contain a chemical additive, and therefore a blood collection set must be used for blood collection to prevent possible backflow from the tube. Also, follow the instructions under Section 1: Collection of Blood into Norgen's Blood RNA Preservative Tubes.
- Transferring a sample from a syringe to a tube is not recommended. Additional manipulation of sharps increases the potential for needle stick injuries.
- Only use the protocol provided in this insert. Alterations to the protocol and deviations from the times and temperatures specified may lead to erroneous results

Quality Control
In accordance with Norgen's ISO 9001 and ISO 13485-certified Quality Management System, each lot of Norgen's Blood RNA Preservative Tubes are tested against predetermined specifications to ensure consistent product quality.

Product Use Limitations
For research use only. Not for use in diagnostic procedures

Product Warranty and Satisfaction Guarantee
NORGEN BIOTEK CORPORATION guarantees the performance of all products in the manner described in our product manual. The customer must determine the suitability of the product for its particular use.

Safety Information
Ensure that a suitable lab coat, disposable gloves and protective goggles are worn when working with chemicals. For more information, please consult the appropriate Material Safety Data Sheets (MSDSs). These are available as convenient PDF files online at *www.norgenbiotek.com*.

To avoid the risk of infection (e.g., from HIV or hepatitis B viruses) or injury when working with biological and chemical materials, always wear a suitable lab coat, disposable gloves, and protective goggles. The **Blood RNA Preservative** and blood mixture from Norgen's **Blood RNA Preservative** can be disinfected using 1 volume of commercial bleach solution (5% sodium hypochlorite) per 9 volumes of the **Blood RNA Preservative** solution and blood mixture.

Collection and Storage of Blood in Norgen's Blood RNA Preservative

1. Collection of Blood in Norgen's Blood RNA Preservative Tubes

Warnings:

- Contents of the **Blood RNA Preservative Tube** are irritating to skin
  - In case of eye contact, rinse opened eye for fifteen minutes using running water. Consult a doctor
  - In case of skin contact, wash immediately with water and soap and rinse thoroughly.
  - In case of inhalation, fresh air to be supplied. Consult a doctor in case of any complaints.
  - In case of swallowing. Immediately consult a doctor.
- Ensure that the **Blood RNA Preservative Tube** contents do not touch the tube's stopper or the end of the needle during the process of collecting blood.
- A blood collection set must be used with Norgen's Blood RNA Preservative Tubes. Refer to manufacturer's product documentation for specific instructions on venipuncture technique, blood collection, storage and shipment conditions and safety information.

Notes prior to blood collection:

- Ensure that the **Blood RNA Preservative Tube** is at 18^{o}C to 25^{o}C prior to use and properly labeled with donor identification.

1. Using the **Blood Collection Set**, collect 3mL blood into the **Blood Collection Tube** using your institution's recommended procedure for standard venipuncture technique. **The following procedure shall be used to prevent possible backflow**;
   a) Place donor's arm in a downward position
   b) Hold tube, in a vertical position, below the donor's arm while collecting blood.
   c) As soon as blood starts flowing into **Norgen's Blood RNA Preservative Tube** release the tourniquet.

2. Allow at least 12 seconds for a complete blood draw to take place. Norgen's Blood RNA Preservative Tube, with its vacuum, is designed to draw 3 mL blood into the tube. Ensure the blood has stopped flowing into the tube before removing the tube from the holder. **Ensure that the Blood RNA Preservative Tube contents do not touch the tube's stopper or the end of the needle during the process of collecting blood.**

3. Immediately after blood collection, gently mix the **Blood RNA Preservative** with the 3mL blood by inverting the tube for 10-15 seconds.

IMPORTANT! Failure to mix Norgen's **Blood RNA Preservative** with the blood leads to an inadequate stabilization of the gene expression profile and the formation of microclots that can potentially clog the purification spin-columns.

2. Storage of Preserved Blood collected in Norgen's Blood RNA Preservative Tubes

- Blood collected in Norgen's Blood RNA Preservative Tubes can be stored at room temperature (18°C to 25°C) for 12 days. It is highly recommended to store the preserved blood in a dark place and to avoid exposure of the Preserved Blood to direct light
- Blood collected in Norgen's Blood RNA Preservative Tubes can also be stored at 4°C for 21 days.

- Blood collected in Norgen's Blood RNA Preservative Tubes can also be stored at −20°C upright in a wire rack. Do not freeze the Blood RNA Preservative tubes in a styrofoam rack as the tubes may crack.
- To store the preserved blood collected in Norgen's Blood RNA Preservative Tubes at a temperature below −20°C, it is highly recommended to use polypropylene cryo vials with screw caps. For storing the preserved blood at a temperature below −20°C (−70°C or −80°C), freeze the preserved blood first at −20°C for 24 hours then transfer to −70°C or −80°C.
- When thawing the frozen preserved blood, thaw at room temperature (18°C to 25°C) for 2 hours then carefully mix the thawed preserved blood 10 times. **Do not thaw the frozen preserved blood at temperatures above 25°C.**

3. Isolation of RNA from Preserved Blood collected in Norgen's Blood RNA Preservative Tubes

RNA can be isolated from the preserved blood using Norgen's Preserved Blood RNA Isolation Kit (for use with Norgen Blood RNA Preservative Tubes). Please see Related Products table below for ordering information.

Related Products	Product #
Preserved Blood RNA Purification Kit (for use with Norgen Blood RNA Preservative Tubes) – 48 preps	52600
Preserved Blood RNA Purification Kit (for use with Norgen Blood RNA Preservative Tubes) – 96 preps	52700
Blood RNA Preservative Tubes and Preserved Blood RNA Purification Kit – 48 preps	52620
Blood RNA Preservative Tubes and Preserved Blood RNA Purification Kit – 96 preps	52720

Technical Assistance

NORGEN's Technical Service Department is staffed by experienced scientists with extensive practical and theoretical expertise in sample and assay technologies and the use of NORGEN products. If you have any questions or experience any difficulties regarding Norgen's Blood RNA Preservation Tubes or NORGEN products in general, please do not hesitate to contact us.

NORGEN customers are a valuable source of information regarding advanced or specialized uses of our products. This information is helpful to other scientists as well as to the researchers at NORGEN. We therefore encourage you to contact us if you have any suggestions about product performance or new applications and techniques.

For technical assistance and more information, please contact our Technical Support Team between the hours of 8:30 and 5:30 (Eastern Standard Time) at (905) 227-8848 or Toll Free at 1-866-667-4362. or call one of the NORGEN local distributors (www.norgenbiotek.com) or through email at techsupport@norgenbiotek.com.

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